IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Wang et al.	§	Group Art Unit: 2813
Serial No.: 10/799,146	§	
Confirmation No.: 7933	§	Examiner: Monica D. Harrison
Filed: March 12, 2004	§	
For: Method of Depositing an Amorphous Carbon Film for Etch Hardmask Application	§	

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March 9, 2007
Date

Steven H. VerSteeg

Dear Sir:

APPEAL BRIEF

Appellants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 2813 dated July 13, 2006, finally rejecting claims 1-37. The final rejection of claims 11, 17, 18, 20, 24, 26, 27, 34, and 37 is appealed. This Appeal Brief is believed to be timely since mailed by the due date of March 16, 2007, as set by mailing a Notice of Appeal on January 16, 2007. Authorization to charge the fee of $500.00 for filing this brief is provided on a separate fee transmittal. Please charge any additional fees that may be required to make this Appeal Brief timely and acceptable to Deposit Account No. 20-0782/008244/KMT.

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Real Party in Interest

The present application has been assigned to Applied Materials, Inc., 3050 Bowers Avenue, Santa Clara, California 95054.

Related Appeals and Interferences

Appellants note that the rejection of related claims was appealed in United States Patent Application Serial No. 11/065,464, filed on February 24, 2005.

Status of Claims

Claims 1-37 are pending in the application. Claims 1-37 were originally presented in the application. Claims 1, 9, and 22 were amended in Appellants' response to the Office Action mailed December 29, 2005 that was filed March 27, 2006. Claims 1-37 were finally rejected in the Final Office Action mailed July 13, 2006. The final rejection of claims 11, 17, 18, 20, 24, 26, 27, 34, and 37 is appealed. The pending claims are shown in the attached Claims Appendix.

Status of Amendments

A response to the Office Action mailed December 29, 2005 was filed March 27, 2006 and entered. A first Response to the Final Office Action mailed July 13, 2006 was filed September 13, 2006. In the Advisory Action mailed October 11, 2006, the Examiner indicated that the response would not be entered. A second Response to the Final Office Action mailed July 13, 2006 was filed November 1, 2006. In the Advisory Action mailed January 19, 2007, the Examiner indicated that the response would not be entered.

Summary of Claimed Subject Matter

Claimed embodiments of the invention provide a method for processing a substrate comprising depositing an amorphous carbon layer on the substrate (p.6, paragraph [0020], lines 3-4).

In the embodiments of claim 11, a method for processing a substrate in a processing chamber comprises forming a dielectric material layer on a surface of the substrate (p.15, paragraph [0051], line 1, Figure 2A, item 220), depositing one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the dielectric material layer (p.15, paragraph [0052], lines 1-2, Figure 2A, item 230; p.7, paragraph [0022], lines 1-7) by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas (p.7-8, paragraph [0024], line 1 – [0025], line 10), generating a plasma of the processing gas by applying power from a dual-frequency RF source (p.8, paragraph [0026], lines 1-11; p.8, paragraph [0027], lines 1-2), etching the one or more amorphous carbon layers to form a patterned amorphous carbon layer (p.17, paragraph [0058], lines 3-5, Figure 2B), etching feature definitions in the dielectric material layer corresponding to the patterned one or more amorphous carbon layers (p.17, paragraph [0059], lines 1-3, Figure 2C), depositing an anti-reflective coating on the one or more amorphous carbon layers (p.16, paragraph [0056], lines 1-4), patterning resist material on the anti-reflective coating (p.17, paragraph [0057], lines 1-2), and etching the anti-reflective coating prior to or concurrent with etching the one or more amorphous carbon layers (p.17, paragraph [0058], lines 1-5, Figure 2B).

In the embodiments of claim 17, a method for processing a substrate in a processing chamber comprises forming a dielectric material layer on a surface of the substrate (p.15, paragraph [0051], line 1, Figure 2A, item 220), depositing one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the dielectric material layer (p.15, paragraph [0052], lines 1-2, Figure 2A, item 230; p.7, paragraph [0022], lines 1-7) by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas (p.7-8, paragraph [0024], line 1 – [0025], line 10), generating a plasma

of the processing gas by applying power from a dual-frequency RF source (p.8, paragraph [0026], lines 1-11; p.8, paragraph [0027], lines 1-2), etching the one or more amorphous carbon layers to form a patterned amorphous carbon layer (p.17, paragraph [0058], lines 3-5, Figure 2B), etching feature definitions in the dielectric material layer corresponding to the patterned one or more amorphous carbon layers (p.17, paragraph [0059], lines 1-3, Figure 2C), wherein at least one of the one or more amorphous carbon layers comprise an anti-reflective coating (p.16, paragraph [0056], lines 1-4).

In the embodiments of claim 24, a method for processing a substrate comprises depositing one or more dielectric layers on a substrate surface (p.15, paragraph [0050], lines 1-3, Figure 2A, item 210; p.15, paragraph [0051], line 1, Figure 2A, item 220), wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less (p. 15, paragraph [0050], lines 4-6, Figure 2A, item 210), forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers (p.15, paragraph [0052], lines 1-2, Figure 2A, item 230; p.7, paragraph [0022], lines 1-7) by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas (p.7-8, paragraph [0024], line 1 – [0025], line 10), generating a plasma of the processing gas by applying power from a dual-frequency RF source (p.8, paragraph [0026], lines 1-11; p.8, paragraph [0027], lines 1-2), defining a pattern in at least one region of the one or more amorphous carbon layers (p.17, paragraph [0058], lines 3-5, Figure 2B), forming feature definitions in the one or more dielectric layers by the pattern formed in the at least one region of the one or more amorphous carbon layers (p.17, paragraph [0059], lines 1-3, Figure 2C), depositing one or more conductive materials in the feature definitions (p.18, paragraph [0061], lines 1-2, Figure 2E, item 260), and removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas prior to depositing one or more conductive materials in the feature definitions (p.18, paragraph [0060], lines 1-3), wherein the hydrogen-containing gas comprises a gas selected from the group of hydrogen, ammonia, water vapor, and combinations thereof (p. 11-12, paragraphs [0037], line 1 – [0038], line 5).

In the embodiments of claim 26, a method for processing a substrate comprises

depositing one or more dielectric layers on a substrate surface (p.15, paragraph [0050], lines 1-3, Figure 2A, item 210; p.15, paragraph [0051], line 1, Figure 2A, item 220), wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less (p. 15, paragraph [0050], lines 4-6, Figure 2A, item 210), forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers (p.15, paragraph [0052], lines 1-2, Figure 2A, item 230; p.7, paragraph [0022], lines 1-7) by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas (p.7-8, paragraph [0024], line 1 – [0025], line 10), generating a plasma of the processing gas by applying power from a dual-frequency RF source (p.8, paragraph [0026], lines 1-11; p.8, paragraph [0027], lines 1-2), defining a pattern in at least one region of the one or more amorphous carbon layers (p.17, paragraph [0058], lines 3-5, Figure 2B), forming feature definitions in the one or more dielectric layers by the pattern formed in the at least one region of the one or more amorphous carbon layers (p.17, paragraph [0059], lines 1-3, Figure 2C), depositing one or more conductive materials in the feature definitions (p.18, paragraph [0061], lines 1-2, Figure 2E, item 260), polishing the one or more conductive materials and stopping on the one or more amorphous carbon layers (p.21, paragraph [0071], lines 1-4), and removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas (p.18, paragraph [0060], lines 1-3).

In the embodiments of claim 27, a method for processing a substrate comprises depositing one or more dielectric layers on a substrate surface (p.15, paragraph [0050], lines 1-3, Figure 2A, item 210; p.15, paragraph [0051], line 1, Figure 2A, item 220), wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less (p. 15, paragraph [0050], lines 4-6, Figure 2A, item 210), forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers (p.15, paragraph [0052], lines 1-2, Figure 2A, item 230; p.7, paragraph [0022], lines 1-7) by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas (p.7-8, paragraph [0024], line 1 – [0025], line

10), generating a plasma of the processing gas by applying power from a dual-frequency RF source (p.8, paragraph [0026], lines 1-11; p.8, paragraph [0027], lines 1-2), defining a pattern in at least one region of the one or more amorphous carbon layers (p.17, paragraph [0058], lines 3-5, Figure 2B), forming feature definitions in the one or more dielectric layers by the pattern formed in the at least one region of the one or more amorphous carbon layers (p.17, paragraph [0059], lines 1-3, Figure 2C), depositing one or more conductive materials in the feature definitions (p.18, paragraph [0061], lines 1-2, Figure 2E, item 260), depositing an anti-reflective coating on the one or more amorphous carbon layers (p.16, paragraph [0056], lines 1-4), patterning resist material on the anti-reflective coating (p.17, paragraph [0057], lines 1-2), and etching the anti-reflective coating prior to or concurrent with etching the one or more amorphous carbon layers (p.17, paragraph [0058], lines 1-5, Figure 2B).

Ground of Rejection to be Reviewed on Appeal

Whether claims 11, 17, 18, 20, 24, 26, 27, 34, and 37 are anticipated by U.S. Patent Publication No. 2004/0072430 A1 to *Huang et al.*

Arguments

Claims 11, 17, 18, 20, 24, 26, 27, 34, and 37 are not anticipated by *Huang et al.*

Claims 11, 17, 18, 20, 24, 26, 27, 34, and 37 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over U.S. Patent Publication No. 2004/0072430 A1 to *Huang et al.*

Huang et al. does not disclose or suggest a method for processing a substrate comprising depositing an anti-reflective coating on the one or more amorphous carbon layers as required by claim 11 and asserted by the Examiner because the anti-reflective coating (*i.e.*, the BARC layer in paragraph [0066]) in *Huang et al.* is deposited between a SiO_2 layer and the photoresist mask, which is below the protective layer formed of amorphous carbon (see paragraph [0066], lines 1-4 and Figure 3). Therefore, *Huang et al.*, alone or in combination, does not teach, show, or suggest a method for processing a substrate in a processing chamber comprising forming a dielectric material layer on a surface of the substrate, depositing one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the dielectric material layer by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas, generating a plasma of the processing gas by applying power from a dual-frequency RF, etching the one or more amorphous carbon layers to form a patterned amorphous carbon layer, etching feature definitions in the dielectric material layer corresponding to the patterned one or more amorphous carbon layers, depositing an anti-reflective coating on the one or more amorphous carbon layers, patterning resist material on the anti-reflective coating, and etching the anti-reflective coating prior to or concurrent with etching the one or more amorphous carbon layers, as recited in claim 11, and claims dependent thereon.

Huang et al. also does not disclose or suggest a method for processing a substrate wherein at least one of the one or more amorphous carbon layers comprises an anti-reflective coating as required by claim 17 and asserted by the Examiner because the anti-reflective coating (*i.e.*, the BARC layer in paragraph [0023]) in *Huang*

et al. referred to by the Examiner is a prior art BARC layer made of silicon nitride, SiON, or other material with a high refractive index and high extinction coefficient (see paragraph [0014], lines 11-16). There is no discussion of an amorphous carbon BARC layer in *Huang et al.* Therefore, *Huang et al.*, alone or in combination, does not teach, show, or suggest a method for processing a substrate in a processing chamber comprising forming a dielectric material layer on a surface of the substrate, depositing one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the dielectric material layer by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas, generating a plasma of the processing gas by applying power from a dual-frequency RF source, etching the one or more amorphous carbon layers to form a patterned amorphous carbon layer, etching feature definitions in the dielectric material layer corresponding to the patterned one or more amorphous carbon layers, wherein at least one of the one or more amorphous carbon layers comprise an anti-reflective coating, as recited in claim 17.

Huang et al. further does not disclose or suggest a method for processing a substrate wherein the hydrogen-containing gas is selected from the group of hydrogen, ammonia, water vapor, and combinations thereof as required by claim 24 and asserted by the Examiner because *Huang et al.* makes no mention of a hydrogen-containing gas selected from the group of hydrogen, ammonia, water vapor, and combinations thereof in paragraph [0054] as stated by the Examiner. Therefore, *Huang et al.*, alone or in combination, does not teach, show, or suggest a method for processing a substrate comprising depositing one or more dielectric layers on a substrate surface, wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less, forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas, generating a plasma of the processing gas by applying power from a dual-frequency RF source, defining a pattern in at least one region of the one or more amorphous carbon layers, forming feature definitions in the one or more dielectric layers by the pattern formed in the at

least one region of the one or more amorphous carbon layers, depositing one or more conductive materials in the feature definitions, and removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas prior to depositing one or more conductive materials in the feature definitions, wherein the hydrogen-containing gas comprises a gas selected from the group of hydrogen, ammonia, water vapor, and combinations thereof, as recited in claim 24.

Huang et al. additionally does not disclose or suggest a method for processing a substrate comprising removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas as required by claim 26 and asserted by the Examiner because *Huang et al.* makes no mention of a hydrogen-containing gas selected from the group of hydrogen, ammonia, water vapor, and combinations thereof in paragraph [0054] as stated by the Examiner. Therefore, *Huang et al.*, alone or in combination, does not teach, show, or suggest a method for processing a substrate comprising depositing one or more dielectric layers on a substrate surface, wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less, forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas, generating a plasma of the processing gas by applying power from a dual-frequency RF source, defining a pattern in at least one region of the one or more amorphous carbon layers, forming feature definitions in the one or more dielectric layers by the pattern formed in the at least one region of the one or more amorphous carbon layers, depositing one or more conductive materials in the feature definitions, polishing the one or more conductive materials and stopping on the one or more amorphous carbon layers, and removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas, as recited in claim 26.

Huang et al. also does not disclose or suggest a method for processing a substrate comprising depositing an anti-reflective coating on the one or more

amorphous carbon layers as required by claim 27 and asserted by the Examiner because the anti-reflective coating (*i.e.*, the BARC layer in paragraph [0066]) in *Huang et al.* is deposited between a SiO_2 layer and the photoresist mask, which is below the protective layer formed of amorphous carbon (see paragraph [0066], lines 1-4 and Figure 3). Therefore, *Huang et al.*, alone or in combination, does not teach, show, or suggest a method for processing a substrate comprising depositing one or more dielectric layers on a substrate surface, wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less, forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers by a process comprising introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas, generating a plasma of the processing gas by applying power from a dual-frequency RF source, defining a pattern in at least one region of the one or more amorphous carbon layers, forming feature definitions in the one or more dielectric layers by the pattern formed in the at least one region of the one or more amorphous carbon layers, depositing one or more conductive materials in the feature definitions, depositing an anti-reflective coating on the one or more amorphous carbon layers, patterning resist material on the anti-reflective coating, and etching the anti-reflective coating prior to or concurrent with etching the one or more amorphous carbon layers, as recited in claim 27, and claims dependent thereon.

Conclusion

The Examiner errs in finding that *Huang et al.* anticipates claims 11, 17, 18, 20, 24, 26, 27, 34, and 37. It is respectfully requested that the Examiner's rejections be reversed.

Respectfully submitted,

Keith M. Tackett
Registration No. 32,008
Patterson & Sheridan, L.L.P.
3040 Post Oak Blvd. Suite 1500
Houston, TX 77056
Telephone: (713) 623-4844
Facsimile: (713) 623-4846
Attorney for Appellants

Claims Appendix

1. (Previously Presented) A method for processing a substrate in a processing chamber, comprising:

positioning the substrate in a processing chamber;

introducing a processing gas into the processing chamber, wherein the processing gas comprises one or more hydrocarbon compounds without containing silicon and an argon carrier gas;

generating a plasma of the processing gas by applying power from a dual-frequency RF source; and

depositing an amorphous carbon layer consisting essentially of hydrogen and carbon on the substrate.

2. (Original) The method of claim 1, further comprising etching the amorphous carbon layer to form a patterned amorphous carbon layer.

3. (Original) The method of claim 1, wherein the one or more hydrocarbon compounds have the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10.

4. (Original) The method of claim 3, wherein the one or more hydrocarbon compounds are selected from the group consisting of propylene (C_3H_6), propyne (C_3H_4), propane (C_3H_8), butane (C_4H_{10}), butylene (C_4H_8), butadiene (C_4H_6), acetylene (C_2H_2), and combinations thereof.

5. (Original) The method of claim 1, further comprising removing the amorphous carbon layer from the substrate using a hydrogen-containing plasma, an oxygen-containing plasma, or combination thereof.

6. (Original) The method of claim 3, wherein the generating the plasma comprises applying a first RF power at a first frequency and applying a second RF power at a second frequency less than the first frequency.

7. (Original) The method of claim 6, wherein the generating the plasma comprises applying a first RF power between at a first frequency between about 10 Mhz and about 30 Mhz applying a second RF power at a second frequency between about 100kHz and about 500KHz.

8. (Original) The method of claim 6, wherein the ratio of second RF power to first RF power is less than about 0.6:1.

9. (Previously Presented) A method for processing a substrate in a processing chamber, comprising:

forming a dielectric material layer on a surface of the substrate;

depositing one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the dielectric material layer by a process comprising:

introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas;

generating a plasma of the processing gas by applying power from a dual-frequency RF source;

etching the one or more amorphous carbon layers to form a patterned amorphous carbon layer; and

etching feature definitions in the dielectric material layer corresponding to the patterned one or more amorphous carbon layers.

10. (Original) The method of claim 9, further comprising:

removing the one or more amorphous carbon layers; and

depositing a conductive material on the surface of the substrate.

11. (Original) The method of claim 9, further comprising:

depositing an anti-reflective coating on the one or more amorphous carbon layers; and

patterning resist material on the anti-reflective coating; and

etching the anti-reflective coating prior to or concurrent with etching the one or more amorphous carbon layers.

12. (Original) The method of claim 9, wherein the hydrocarbon compound has the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10.

13. (Original) The method of claim 12, wherein the one or more hydrocarbon compounds are selected from the group consisting of propylene (C_3H_6), propyne (C_3H_4),

propane (C_3H_8), butane (C_4H_{10}), butylene (C_4H_8), butadiene (C_4H_6), acetylene (C_2H_2), and combinations thereof.

14. (Original) The method of claim 9, wherein the generating the plasma comprises applying a first RF power at a first frequency and applying a second RF power at a second frequency less than the first frequency.

15. (Original) The method of claim 14, wherein the generating the plasma comprises applying a first RF power between at a first frequency between about 10 Mhz and about 30 Mhz applying a second RF power at a second frequency between about 100kHz and about 500KHz.

16. (Original) The method of claim 9, wherein the ratio of second RF power to first RF power is less than about 0.6:1.

17. (Original) The method of claim 9, wherein at least one of the one or more amorphous carbon layers comprise an anti-reflective coating.

18. (Original) The method of claim 11, wherein the anti-reflective coating is a material selected from the group of silicon nitride, silicon carbide, carbon-doped silicon oxide, amorphous carbon, and combinations thereof.

19. (Original) The method of claim 9, further comprising depositing a barrier layer prior to depositing the dielectric material.

20. (Original) The method of claim 11, further comprising removing the resist material prior to etching feature definitions in the dielectric layer.

21. (Original) The method of claim 9, wherein the etch selectivity of amorphous carbon to the dielectric material is greater than about 1:10.

22. (Previously Presented) A method for processing a substrate, comprising:

depositing one or more dielectric layers on a substrate surface, wherein the one or more dielectric layers comprise silicon, oxygen, and carbon and has a dielectric constant of about 3 or less;

forming one or more amorphous carbon layers consisting essentially of hydrogen and carbon on the one or more dielectric layers by a process comprising:

introducing a processing gas comprising one or more hydrocarbon compounds without containing silicon and an argon carrier gas;

generating a plasma of the processing gas by applying power from a dual-frequency RF source;

defining a pattern in at least one region of the one or more amorphous carbon layers;

forming feature definitions in the one or more dielectric layers by the pattern formed in the at least one region of the one or more amorphous carbon layers; and

depositing one or more conductive materials in the feature definitions.

23. (Original) The method of claim 22, further comprising removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas prior to depositing one or more conductive materials in the feature definitions.

24. (Original) The method of claim 23, wherein the hydrogen-containing gas comprises a gas selected from the group of hydrogen, ammonia, water vapor, and combinations thereof.

25. (Original) The method of claim 23, wherein the plasma is generated by applying a power level between about 0.15 watts/cm^2 and about 5 watts/cm^2 to the chamber between for between about 10 seconds and about 120 seconds.

26. (Original) The method of claim 22, further comprising:

polishing the one or more conductive materials and stopping on the one or more amorphous carbon layers; and

removing the one or more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas.

27. (Original) The method of claim 22, further comprising:

depositing an anti-reflective coating on the one or more amorphous carbon layers; and

patterning resist material on the anti-reflective coating; and

etching the anti-reflective coating prior to or concurrent with etching the one or more amorphous carbon layers.

28. (Original) The method of claim 22, wherein the hydrocarbon compound has the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10.

29. (Original) The method of claim 28, wherein the one or more hydrocarbon compounds are selected from the group consisting of propylene (C_3H_6), propyne (C_3H_4), propane (C_3H_8), butane (C_4H_{10}), butylene (C_4H_8), butadiene (C_4H_6), acetylene (C_2H_2), and combinations thereof.

30. (Original) The method of claim 28, wherein the one or more hydrocarbon compounds further comprises one or more fluorinated derivatives of the one or more hydrocarbon compounds.

31. (Original) The method of claim 22, wherein the generating the plasma comprises applying a first RF power at a first frequency and applying a second RF power at a second frequency less than the first frequency.

32. (Original) The method of claim 31, wherein the generating the plasma comprises applying a first RF power between at a first frequency between about 10 Mhz and about 30 Mhz applying a second RF power at a second frequency between about 100kHz and about 500KHz.

33. (Original) The method of claim 31, wherein the ratio of second RF power to first RF power is less than about 0.6:1.

34. (Original) The method of claim 27, wherein the anti-reflective coating is a material selected from the group of silicon nitride, silicon carbide, carbon-doped silicon oxide, amorphous carbon, and combinations thereof.

35. (Original) The method of claim 22, further comprising depositing a barrier layer prior to depositing the at least one dielectric material.

36. (Original) The method of claim 22, wherein the etch selectivity of amorphous carbon to the dielectric material is greater than about 1:10.

37. (Original) The method of claim 27, wherein at least one of the one or more amorphous carbon layers comprise an anti-reflective coating.

Evidence Appendix

NONE

Related Proceedings Appendix

No copies of decisions rendered by a court or the Board in the related appeal or interference listed on page 4 of this Brief are included as there have been no decisions by the court or the Board in the related appeal or interference listed on page 4 of this Brief.